APPENDIX III: GLOSSARY

Abiotic — non-living

Aerobic — (of an organism or tissue) requiring air for life; pertaining to or caused by the presence of oxygen

Algae — non-vascular plants that are very small; algae are the main producers of food and oxygen in aquatic environments

Alluvial plain — the floodplain of a river, where the soils are deposited by the overflowing river

Alluvium — any sediment deposited by flowing water, as in a riverbed, floodplain, or delta

Alternate hypothesis — a statistical hypothesis that disagrees with the tested hypothesis, e.g., these two wetlands do not have the same vegetation community

Anaerobic — living in the absence of oxygen; pertaining to or caused by the absence of oxygen

Anoxic — without oxygen

Anthropogenic — caused by humans; often used when referring to human induced environmental degradation

Aquatic — living or growing in or on water

Attenuation — to lessen the amount, force, magnitude, or value of

Backwater — a body of water in which the flow is slowed or turned back by an obstruction such as a bridge or dam, an opposing current, or the movement of the tide

Baseline measurements — a set of measurements taken to assess the current or pre-restoration condition of a community or ecosystem

Beach seine — a short (typically 20 m or less) fine mesh catch net that can be pulled through shallow water on to beach areas by hand

Benthic — on the bottom or near the bottom of streams, lakes, or oceans

Biogenic — produced by living organisms

Biomass — the amount of living matter, in the form of organisms, both plants and animals, present in a particular habitat, usually expressed as weight-per-unit area

Blackwater streams — streams that do not carry sediment, but are dark in color due to the tannins dissolved in them from flowing through peat-based areas

Brackish — water with a salinity intermediate between seawater and freshwater, often referred to as oligohaline (salinity 0.5 to 5.0 ppt). Interlacing or tangled network of several small branching and reuniting shallow channels are also often present.

Brackish marsh — marsh areas containing a mixture of salt and fresh water; however, the salinity level is less than seawater

Breeder trap — a small box shaped trap containing a funneled entrance and constructed of clear plexiglass, that is set on the sediment surface to catch fry and small sized fish species

Calcareous — sediment/soil formed of calcium carbonate or magnesium carbonate due to biological deposition or inorganic precipitation

Catchment — the land area drained by a river or stream; also known as "watershed" or "drainage basin"; the area is determined by topography that divides drainage between watersheds

Coastal habitat restoration — the process of reestablishing a self-sustaining habitat in coastal areas that in time can come to closely resemble a natural condition in terms of structure and function

Coastal habitat restoration monitoring — the systematic collection and analysis of data that provides information useful for measuring coastal habitat restoration project performance

Community — all the groups of organisms living together in the same area, usually interacting or depending on each other for existence; all the living organisms present in an ecosystem

Coral reefs — highly diverse ecosystems, found in warm, clear, shallow waters of tropical oceans worldwide. They are composed of marine polyps that secrete a hard calcium carbonate skeleton, which serves as a base or substrate for the colony.

Coralline algae — algae that contains a coral-like, calcareous outer covering

Cost estimate — estimates on costs of planning and carrying out a project. Examples of items that may be included in a cost estimate for a monitoring plan may be personnel, authority to provide easements and rights-of-way, maintenance, labor, and equipment.

Deepwater swamps — forested wetlands that develop along edges of lakes, alluvial river swamps, in slow-flowing strands, and in large, coastal-wetland complexes. They can be found along the Atlantic and Gulf Coasts and throughout the Mississippi River valley. They are distinguished from other forested habitats by the tolerance of the dominant vegetation to prolonged flooding.

Demersal — bottom-feeding or bottom-dwelling fish, crustaceans, and other free moving organisms

Desiccation – process of extracting moisture

Detritivorous — the practice of eating primarily detritus

Detritus — fine particles of decaying organic and inorganic matter formed by excrement and by plant and animal remains; may be suspended in water or accumulated on the bottom of a water body

Diatoms — any of a class (Bacillariophyceae) of minute planktonic unicellular or colonial algae with silica-based skeletons

Dissolved oxygen — oxygen dissolved in water and available to aquatic organisms; one of the most important indicators of the condition of a water body; concentrations below 5 mg/l are stressful and may be lethal to many fish and other species

Dominant species — a plant species that exerts a controlling influence on or defines the character of a community

Downwelling — the process of build-up and sinking of warm surface waters along coastlines

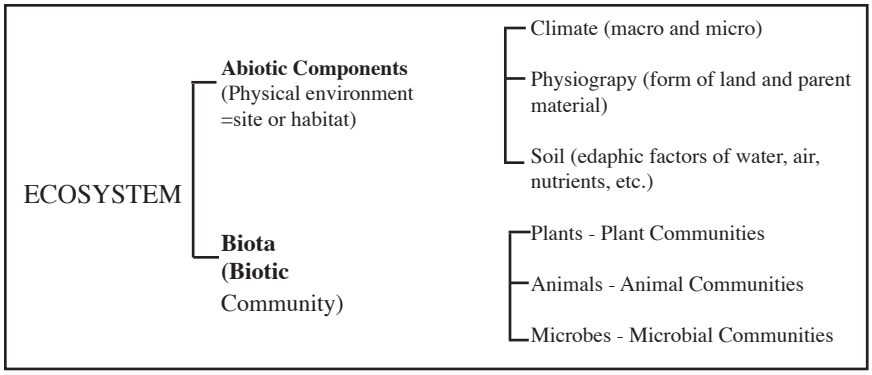
Drop sampler — a shallow water sampling device, typically 1 – 2 m in diameter used to collect fish and decapods via a drop in the water from a boom or support platform, and subsequent collection using small seines or suction pumping the water within the trap

Duration — a span or interval of time

Ebb — a period of fading away; low tide

Echinoderms — any of a phylum (Echinodermata) of radially symmetrical primitive marine animals including the starfishes, sea urchins, and related forms

Ecosystem — a volume of land and air including all the biotic and abiotic components (*Graphic courtesy of B. Barnes, University of Michigan*)



Emergent plants — aquatic plants with roots and part of the stem below water level, but the rest of the plant is above water; e.g., cattails and bulrushes

Ephemeral — lasting a very short time

Epifaunal — animals living on the surface of the sediment or other substrate such as debris

Epiphytes — plants that grow on another plant or object upon which it depends for mechanical support but not as a source of nutrients; i.e. not parasitic

Estuary — a part of a river, stream, or other body of water that has at least a seasonal connection with the open sea or Great Lakes and where the seawater or Great Lakes water mixes

with the surface or subsurface water flow, regardless of the presence of man-made structures or obstructions

Eulittoral — refers to that part of the shoreline that is situated between the highest and lowest seasonal water levels

Eutrophic — designating a body of water in which the increase of mineral and organic nutrients has reduced the dissolved oxygen, producing an environment that favors plant over animal life

Eutrophication — a natural process, that can be accelerated by human activities, whereby the concentration of nutrients in rivers, estuaries, and other bodies of water increases; over time this can result in anaerobic (lack of oxygen) conditions in the water column; the increase of nutrients stimulates algae "blooms" as the algae decays and dies, the availability of dissolved oxygen is reduced; as a result, creatures living in the water accustomed to aerobic conditions perish

Evapotranspiration — the combination of water that is evaporated and transpired by plants as a part of their metabolic processes

Exotic species — plants or animals not native to the area

Fauna — animals collectively, especially the animals of a particular region or time

Fecal coliforms — any of several bacilli, especially of the genera *Escherichia*, found in the intestines of animals. Their presence in water suggests contamination with sewage of feces, which in turn could mean that disease-causing bacteria or viruses are present. Fecal coliform bacteria are used to indicate possible sewage contamination. Fecal coliform bacteria are not harmful themselves, but indicate the possible presence of disease-causing bacteria, viruses, and protozoans that live in human and animal digestive systems. In addition to the possible health risks associated with them, the bacteria can also cause cloudy water, unpleasant odors, and decrease dissolved oxygen in the water.

Fetch — the distance along open water or land over which the wind blows

Flooding regime — pattern of flooding over time

Floodplain — a strip of relatively flat land bordering a stream channel that may be overflowed at times of high water; the amount of land inundated during a flood is relative to the severity of a flood event

Flora — plants collectively, especially the plants of a particular region or time

Fluvial — of, relating to, or living in a stream or river

Food chain — interrelations of organisms that feed upon each other, transferring energy and nutrients; typically solar energy is processed by plants who are eaten by herbivores which in turn are eaten by carnivores: sun –> grass –> mouse –> owl

Food webs — the combined food chains of a community or ecosystem

Frequency — how often something happens

Fronds — leaf-like structures of kelp plants

Function — refers to how wetlands and riparian areas work – the physical, chemical, and biological processes that occur in these settings, which are a result of their physical and biological structure regardless of any human benefit

Functional habitat characteristics — parameters that describe what ecological service a habitat provides and may be used as a measure to determine how well a particular place performs a specific function

Fyke net — a collection net which is staked to the sediment aurface and constructed of small mesh that uses tidal fluctuation or current to entrain fish and decapods via wings that act to funnel the catch into a box like mouth containing a series of chambers and partitions used to retain the catch

Gastropods — any of a large class (Gastropoda) of mollusks (as snails and slugs) usually with a single shell or no shell and a distinct head bearing sensory organs

Geomorphic — pertaining to the form of the Earth or its surface features

Geomorphology — the science that treats the general configuration of the Earth's surface; the description of landforms

Habitat — the sum total of all the living and non-living factors that surround and potentially influence an organism; a particular organism's environment

Hectare – the area of a square 100 m on each side: approximately 107,600 square feet; 12,000 square yards; or 2.5 acres

Herbivory — the act of feeding on plants

Holdfasts — a part by which a plant clings to a surface

Hydric soil — a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. Field indicators of hydric soils can include a thick layer of decomposing plant material on the surface; the odor of rotten eggs (sulfur); and colors of bluish–gray, gray, black, with occasional contrasting brighter spots of color

Hydrodynamics — the motion of water that generally corresponds to its capacity to do work such as transport sediments, erode soils, flush pore waters in sediments, fluctuate vertically, etc. Motions can vary within each of three flow types: primarily vertical, primarily bidirectional and horizontal, and primarily unidirectional and horizontal. Vertical

fluxes are driven by evapotranspiration and precipitation. Bidirectional flows are driven by astronomic tides and wind-driven seiches. Unidirectional flows are down slope movement that occurs from seepage slopes and on floodplains.

Hydrology — the study of the cycle of water movement on, over and through the earth's surface; the science dealing with the properties, distribution, and circulation of water

Hydroperiod — depth, duration, seasonality, and frequency of flooding

Hydrostatic pressure — the pressure water exerts at any given point when a body of water is in a still motion

Hypersaline — extremely saline, generally over 30 ppt salinity (average ocean water salinity)

Hypoxic — waters with dissolved oxygen less than 2 mg/L, the point at which most aquatic life dies

Infauna — plants that live in the sediment

Interspersion — scattered or distributed at regular intervals

Interstices — a space that intervenes between things; especially one between closely spaced things

Intertidal — an area that is alternately flooded and exposed by tides

Intralittoral — a sub-area of the sublittoral zone where upward-facing rocks are dominated by algae, mainly kelp

Invasive species — a species that does not naturally occur in a specific area and whose introduction is likely to cause economic or environmental harm

Invertebrate — an animal with no backbone or spinal column; invertebrates include 95% of the animal kingdom

Irregularly exposed — refers to coastal wetlands with substrate exposed by tides less frequently than daily

Lacunar — a small cavity, pit, or discontinuity

Lacustrine — pertaining to, produced by, or formed in a lake

Lagoons — a shallow stretch of seawater (or lake water) near or open to the sea (or lake) and partly or completely separated from it by a low, narrow, elongate strip of land

Line transect — a straight line is laid out across a project area. Samples or measurements are taken at specific, predetermined locations along this straight line

Littoral — refers to the shallow water zone (less than 2 m deep) at the end of a water body, commonly seen in lakes or ponds

Macroalgae — relatively shallow (less than 50 m deep) subtidal algal communities dominated by very large brown algae. Kelp and other macroalgae grow on hard or consolidated substrates forming extensive three-dimensional structures that support a diversity of other plants and animals.

Macrofauna — animals large enough to be seen with the naked eye, typically exceeding 1 mm in length or that will not pass through a 1 mm sieve

Macroinvertebrate — animals without backbones that can be seen with the naked eye (caught with a 1 to 2 mm mesh net); includes insects, crayfish, snails, mussels, clams, fairy shrimp, etc.

Macrophytes — plant species that are observed with the naked eye, e.g., vascular plants

Mangroves — swamps dominated by shrubs that live between the sea and the land in areas that are inundated by tides. Mangroves thrive along protected shores with fine-grained sediments where the mean temperature during the coldest month is greater than 20° C, limiting their northern distribution.

Marine polyps — the small living units of a coral, responsible for secreting calcium carbonate maintaining coral reef shape

Marshes (marine and freshwater) — transitional habitats between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water tidally or seasonally. Freshwater species are adapted to the short- and long-term water level fluctuations typical of freshwater ecosystems.

Mast — the nuts of forest trees accumulated on the ground

Meiofauna — diverse microorganisms that are approximately between .042 mm and 1 mm in size

Metadata — data that describes or provides background information on other data

Microfauna — animals that are very small and best identified with the use of a microscope, e.g., protozoans and nematodes

Microinvertebrates — invertebrates so small they can only be observed with a microscope

Micro-topography — very slight changes in the configuration of a surface including its relief and the position of its natural and man-made features

Migratory — a creature that moves from one region to another when the seasons change

Morphology — the study of structure and form, either of biological organisms or features of the earth surface

Mottling — contrasting spots of bright colors in a soil; an indication of some oxidation or ground water level fluctuation

Mudflat — bare, flat bottoms of lakes, rivers and ponds, or coastal waters, largely filled with organic deposits, freshly exposed by a lowering of the water level; a broad expanse of muddy substrate commonly occurring in estuaries and bays

Nanoplankton — plankton of minute size, generally size range is from 2 - 20 micrometers

Native — an animal or plant that lives or grows naturally in a certain region

Nearshore — nearshore waters beginning at the shoreline or the lakeward edge of the coastal wetlands and extending offshore to the deepest lakebed contour where the thermocline typically intersects with the lakebed in late summer or early fall

Non-point source — the origin of any water-carried material from a broad area rather than from a discrete point, e.g., runoff from agricultural fields

Nuisance species — undesirable plants and animals, commonly exotic species

Null hypothesis — a statistical hypothesis the truth of which is to be investigated by sampling, e.g., these two wetlands have the same vegetation community

Nutria — a large South American semi-aquatic rodent (*Myocastor coypus*) with webbed hind feet that has been introduced into parts of Europe, Asia, and North America

Nutrient — any inorganic or organic compound that provides the nourishment needed for the survival of an organism

Nutrient cycling — the transformation of nutrients from one chemical form to another by physical, chemical, and biological processes as they are transferred from one trophic level to another and returned to the abiotic environment

Oligotrophic — a water body that is poor in nutrients, refers mainly to lakes, ponds, and some wetlands

One-hundred year flood — refers to the floodwater levels that would occur once in 100 years, or as a 1.0 percent probability per year

Organic — containing carbon, but possibly also containing hydrogen, oxygen, chlorine, nitrogen, and other elements

Organic material — anything that is living or was living; in soil it is usually made up of nuts, leaves, twigs, bark, etc.

Osmotic stress — water stress due to differences in salinity between an organism and its aquatic environment

Overstory — trees that tower above the surrounding canopy

Oyster beds — dense, highly structured communities of individual oysters growing on the shells of dead oysters

Palustrine — nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%

Pelagic — pertaining to, or living in open water column

pH — a measure of the acidity (less than 7) or alkalinity (greater than 7) of a solution; a pH of 7 is considered neutral

Physiographic setting — the location in a landscape, such as stream headwater locations, valley bottom depression, and coastal position, similar to geomorphic setting

Physiography — a description of the surface features of the Earth, with an emphasis on the mode or origin

Phytoplankton — microscopic floating plants, mainly algae that are suspended in the water column and are transported by wave currents

Piscivorous — feeding on fish

Pit trap — a collection method that uses shallow depressions dug into the sediment surface that are lined with a non porous water retaining container, to collect select fish and decapod species that use depression on the sediment surface as refuge habitats during low tide

Planktivorous — eating primarily plankton

Plankton — plants and animals, generally microscopic and float or drift in fresh or saltwater

Pneumatocysts — known as gas bladders or floaters that help a plant stay afloat, e.g., bladders seen in the brown alga *Macrocystis*

Pneumatophores — specialized roots formed by several species of plants occurring in frequently inundated habitats. The root is erect and protrudes above the soil surface.

Pop net — a shallow water sampling gear typically 1 – 2 m in diameter composed of fine mesh that is used to collect fish and decapods. The pop net is attached to the sediment surface, and after some time a connected float collar is released from the sediment surface to encompass the whole of the water column in the area of the net. Catch within the pop net is then collected via seines or suction pumping the water within the trap.

Population — a collection of individuals of one species or mixed species making up the residents of a particular area

ppt — parts per thousand, the salinity of ocean water is approximately 35 ppt

Prop roots — long root structures that extend midway from the trunk and arch downward creating tangled branching roots above and below the water's surface, such as in the mangrove *Rhizophora*

Propagules — a structure (such as a cutting, a seed, or a spore) from which a new plant can grow

Pseudofeces — material expelled by the oyster without having gone through the animal's digestive system

Quality assurance/quality control plan — a detailed plan that describes the means of data collection, handling, formatting, storage, and public accessibility for a project

Rebar — also called reinforcing bar; a steel rod with ridges for use in reinforced concrete

Receiving water bodies — lakes, estuaries, or other surface waters that have flowing water delivered to them

Redox potential — oxygen-reduction potential, often used to quantify the degree of electrochemical reduction of wetland soils under anoxic conditions

Reference condition — set of selected measurements or conditions to which a restoration project will be compared, may be relatively pristine or very degraded

Reference site — a site that is representative of the expected ecological conditions and integrity of other sites of the same type and region

Regime — a regular pattern of occurrence or action

Restoration — the process of reestablishing a self-sustaining habitat that in time may come to closely resemble a natural condition in terms of structure and function

Restoration monitoring — the systematic collection and analysis of data that provides information useful for measuring restoration project performance at a variety of scales (locally, regionally, and nationally)

Rhizome — somewhat elongate usually horizontal subterranean plant stem that is often thickened by deposits of reserve food material, produces shoots above and roots below, and is distinguished from a true root in possessing buds, nodes, and usually scale-like leaves

Riparian — a form of wetland transition comprised of multiple habitats and located between permanently saturated wetland and upland habitats. These areas exhibit vegetation or physical characteristics reflective of permanent surface of subsurface water influence. Lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels are typically riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

Riverine — associated with rivers

Riverine forests — forests found along sluggish streams, drainage depressions, and in large alluvial floodplains. Although associated with deepwater swamps in the southeastern United

States, riverine forests are found throughout the United States and are not subject to prolonged flooding.

Rock bottom — all wetlands and deepwater habitats with substrates having an areal cover of stones, boulders, or bedrock 75% or greater, and vegetative cover of less than 30%

Rocky shoreline — extensive littoral habitats on wave-exposed coasts, the substrate is composed of boulders, rocks, or cobble

Salinity — the concentration of dissolved salts in a body of water, commonly expressed as parts per thousand

Salt pans — an undrained natural depression in which water gathers and leaves a deposit of salt upon evaporation

Sampling designs — the procedure for selecting samples from a population and the subsequent statistical analysis

SAV (marine, brackish, and freshwater) — flowering plants that grow on soft sediments in sheltered shallow waters of estuaries, bays, lagoons, and lakes. Freshwater species are adapted to the short- and long-term water level fluctuations typical of freshwater ecosystems.

Seasonality — the change in natural cycles over time, such as lunar cycles and flooding cycles; changes from one season to the next

Seiches — a sudden oscillation of the water surface in a moderate-size body of water, caused by wind

Senescence — the life stage in a plant or plant part (such as a leaf) from full maturity to death, also applies to winter dormancy

Sessile — permanently attached or established, not free to move about

Socioeconomic monitoring — tracking of key indicators that characterize the economic and social state of a human community

Soft bottom — loose, unconsolidated substrate characterized by fine to coarse-grained sediment

Soft shoreline — sand beaches and muddy shores; stretches of land covered by loose material, exposed to and shaped by waves and/or wind.

Statistical hypothesis — a statement about the population or populations being sampled, or occasionally a statement about the sampling procedure

Statistical protocol — a method of analyzing a collection of observed values in order to make an inference about one or more characteristic of a population or unit

Strands — a diffuse freshwater stream flowing through a shallow vegetated depression on a gentle slope

Stratified random sampling — a population is divided into subgroups that are homogeneous. Random samples are then taken within each subgroup, assuring that key subgroups within a population are sampled, particularly those in the minority. This type of sampling can be done for populations or for areas.

Structural habitat characteristics — characteristics that define the physical composition of a habitat, the functions an ecosystem can perform are often dependent upon its structure

Subtidal — continuously submerged areas affected by ocean tides

Supralittoral region — an area above the high tide mark receiving splashing from waves

Taxa — a grouping of organisms given a formal taxonomic name such as species, genus, family, etc. (singular form is taxon)

Tested hypothesis — a statistical hypothesis the truth of which is to be investigated by sampling, sometimes called the null hypothesis

Thermocline — a horizontal region in a thermally stratified body of water than separates warmer oxygen-rich surface water from cold oxygen-poor deep water

Tide — the rhythmic, alternate rise and fall of the surface (or water level) of the ocean, and connected bodies of water, occurring twice a day over most of the earth, resulting from the gravitational attraction of the moon, and to a lesser degree, the sun

Time series — an ordered sequence of values of a certain variable that are equally spaced over time

Time series analysis — looking for patterns such as seasonal variations or impacts of events in data sets whose measurements are collected at equally spaced intervals over time

Topography — the general configuration of a land surface or any part of the earth's surface, including its relief and the position of its natural and man-made features

Transient — passing through or by a place with only a brief stay or sojourn

Trophic — refers to food, nutrition, or growth state

Trophic level — a group of organisms united by obtaining their energy from the same part of the food web of a biological community

Unconsolidated — loosely arranged

Understory — trees and tall bushes that are completely submerged under the canopy

Viviparous — producing living young instead of eggs from within the body in the manner of nearly all mammals, many reptiles, and a few fishes; germinating while still attached to the parent plant

Water column — a conceptual volume of water extending from the water surface down to, but not including the substrate, found in marine, estuarine, river, and lacustrine systems

Watershed — surface drainage area that contributes water to a lake, river, or other body of water; the land area drained by a river or stream

Zonation — a state or condition that is marked with bands of color, texture, or different species

Zooplankton — free-floating animals that drift in the water, ranging in size from microscopic organisms to larger animals such as jellyfish